

**MAINTENANCE PLANNING GUIDELINES**

2/2014

**ACTIVITY:** Pipe Culvert Repairs (R319)

**ACTION:** Install Pipe Liners (LF)

**MAJOR & MINOR**

**DEFINITION:** The time and expenses incurred from removing and replacing pipe culverts. Includes time and expenses incurred for installing a new lining in an existing culvert and cleaning and repairing culverts.

**PURPOSE:** To install new pipe liners in existing pipe culverts.

**SCHEDULING:** As needed.

J	F	M	A	M	J	J	A	S	O	N	D
A	E	A	P	A	U	U	U	E	C	O	E
N	B	R	R	Y	N	L	G	P	T	V	C

**RECOMMENDED EQUIPMENT:**

- Trucks
- Backhoe
- Loader
- Mudjack or Concrete Mixer
- Traffic Control Equipment; reference the (See EPG [616.23 Traffic Control for Field Operations](#))

**RECOMMENDED PROCEDURE:**

1. Consult district Design on size and placement of pipe liner.
2. Contact Dig Rite and others to mark utilities.
3. Place traffic control devices as needed.
4. Clean out ditch, if necessary, to make room for liner.
5. Insert liner.
6. Form upstream and downstream ends and mudjack between liner and existing pipe.
7. Grade and reshape shoulder, as necessary.
8. Seed, mulch and place erosion control items as necessary
9. Clean work area.
10. Remove traffic control devices.

**RECOMMENDED MATERIAL:**

- Pipe Liner
- Slurry Mix
- Portland Cement
- Agricultural Lime
- Water

**SAFETY:** Refer to the [Comprehensive Safety Program sharepoint portal](#). Wear all appropriate PPE. Refer to the [Risk Based Assessment](#) for additional information.

**OTHER CONSIDERATIONS:** Use appropriate size liner for application. Follow manufacturer’s instructions on installation.

**REFERENCES:** Missouri Standard Specifications for Highway Construction Section [735](#).

**MAINTENANCE PLANNING GUIDELINES**

2/2014

**ACTIVITY:** Pipe Culvert Repairs (R319)

**ACTION:** Clean & Repair Pipe Culverts

**MAJOR & MINOR**

**DEFINITION:** The time and expenses incurred from removing and replacing pipe culverts. Includes time and expenses incurred for installing a new lining in an existing culvert and cleaning and repairing culverts.

**PURPOSE:** To clean, align, and repair pipe culverts and related structures.

**SCHEDULING:** As needed.

J	F	M	A	M	J	J	A	S	O	N	D
A	E	A	P	A	U	U	U	E	C	O	E
N	B	R	R	Y	N	L	G	P	T	V	C

**RECOMMENDED EQUIPMENT:**

- Trucks
- Water Tank w/Trash Pump
- Concrete Mixer
- Jack
- Loader
- Skid Steer Loader
- Chainsaws
- Tube Flusher
- Traffic Control Equipment, Reference (See EPG [616.23 Traffic Control for Field Operations](#))

**RECOMMENDED PROCEDURE:**

1. Contact Dig Rite and others to mark utilities
2. Place traffic control devices as needed.
3. Fill open joints with joint compound
4. If headwall, flared end section, or pipe end section is settled, align section with jack or loader and compact material under section for support.
5. If ends of corrugated metal pipe are bent and restricted, open with jack.
6. Clean excess compound and debris from work area.
7. Remove traffic control devices.

**RECOMMENDED MATERIAL:**

- Concrete
- Plastic Joint Compound
- Form Material
- Water
- Curing Compound

**SAFETY:** Refer to the [Comprehensive Safety Program sharepoint portal](#). Wear all appropriate PPE. Refer to the [Risk Based Assessment](#) for additional information

**OTHER CONSIDERATIONS:** Check if Corps of Engineers permit is needed.

**REFERENCES:** N/A

**MAINTENANCE PLANNING GUIDELINES**

2/2014

**ACTIVITY:** Pipe Culvert Repairs (R319)

**ACTION:** Clean & Repair Box Culverts

**MAJOR & MINOR**

**DEFINITION:** The time and expenses incurred from removing and replacing pipe culverts. Includes time and expenses incurred for installing a new lining in an existing culvert and cleaning and repairing culverts.

**PURPOSE:** To clean, repair, and fill voids of box culverts and restore roadway drainage.

**SCHEDULING:** As needed.

J	F	M	A	M	J	J	A	S	O	N	D
A	E	A	P	A	U	U	U	E	C	O	E
N	B	R	R	Y	N	L	G	P	T	V	C

**RECOMMENDED EQUIPMENT:**

- Trucks
- Loader, Backhoe, or Excavator
- Concrete Mixer
- Compressor/Breakers
- Water Tank w/Trash Pump
- Traffic Control Equipment, Reference (See EPG [616.23 Traffic Control for Field Operations](#)).

**RECOMMENDED PROCEDURE:**

1. Contact Dig Rite and others to mark utilities
2. Place traffic control devices as needed.

CLEAN OUT

1. Remove drift and debris as needed.

REPAIR

1. Remove bad concrete, form, and pour concrete.

FILL VOIDS

1. Fill large voids and eroded outlet areas with quarry run rock and if needed grout with concrete.
2. Internal voids along the barrel sides and bottom should be mudjacked.
3. Remove traffic control devices.

**RECOMMENDED MATERIAL:**

- Concrete
- Water
- Quarry Run Rock
- Form Material
- Cement
- Agricultural Lime

**SAFETY:** Refer to the [Comprehensive Safety Program sharepoint portal](#). Wear all appropriate PPE. Refer to the [Risk Based Assessment](#) for additional information

**OTHER CONSIDERATIONS:** Check if Corps of Engineers permit is needed.

**REFERENCES:** N/A

**MAINTENANCE PLANNING GUIDELINES**

2/2014

**ACTIVITY:** Pipe Culvert Repairs (R319)

**ACTION:** Replace Pipe & Box Culverts (LF)

**MAJOR & MINOR**

**DEFINITION:** The time and expenses incurred from removing and replacing pipe culverts. Includes time and expenses incurred for installing a new lining in an existing culvert and cleaning and repairing culverts.

**PURPOSE:** To replace deteriorated pipe and box culverts, which have caused the roadway or entrance to settle.

**SCHEDULING:** As needed.

J	F	M	A	M	J	J	A	S	O	N	D
A	E	A	P	A	U	U	U	E	C	O	E
N	B	R	R	Y	N	L	G	P	T	V	C

**RECOMMENDED EQUIPMENT:**

- Trucks
- Backhoe, Excavator, Loader, or Motorgrader
- Mechanical Compactor
- Dragline
- Crane
- Breaker
- Trenching Protective System/Sheeting
- Traffic Control Equipment, (See EPG [616.23 Traffic Control for Field Operations](#))

**RECOMMENDED PROCEDURE:**

1. Contact Dig Rite and others to mark utilities.
2. Consult with Design for culvert drainage design requirements.
3. Develop trenching safety plan with competent person and supervisor.
4. Place traffic control devices as needed.
5. Remove existing pipe or box.
6. Install protective system in trench, if necessary.
7. Prepare subgrade.
8. Place new pipe or box and seal joints.
9. Remove protective system.
10. Compact material in lifts around and over pipe or box.
11. Place and compact surfacing material.
12. Clean work area.
13. Remove traffic control devices.

**RECOMMENDED MATERIAL:**

- Pipe & Accessories
- Joint Compound
- Roadway Surface Material
- Precast Box Culvert
- Backfill Material

**SAFETY:** Refer to the [Comprehensive Safety Program sharepoint portal](#). Wear all appropriate PPE. Refer to the [Risk Based Assessment](#) for additional information

**OTHER CONSIDERATIONS:** If entire roadway is to be closed, local news media, schools, emergency services, and law enforcement agencies should be informed in advance. Check if Corps of Engineers permit is needed.

**REFERENCES:** Missouri Standard Specifications for Highway Construction Sections [725](#), [726](#), [733](#).